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Nuclear Structure Theory Calculations Using the Model Construction Library W. YOUNES, Lawrence Livermore National Laboratory and Rutgers University¹ — A large number of nuclear structure calculations share the same basic characteristics. Typically, energy levels with definite quantum numbers (e.g. spin, parity, isospin etc ...) in one or more nuclei are known, and a particular model with a well defined basis and Hamiltonian is proposed to fit them. A code can be written to iteratively diagonalize the Hamiltonian and give the best fit to the experimental energy levels. The Model Construction Library (MCL) greatly simplifies the implementation of a large class of nuclear structure models by allowing the user to supply only those elements which are specific to the problem (basis, Hamiltonian and observed levels). The program then handles all intermediary tasks, producing eigenvalues, eigenvectors and expectation values requested by the user. This powerful tool allows experimentalists and theorists alike to focus on the physics of data interpretation, without worrying about the coding aspect. The MCL will be presented and applications to a variety of nuclear structure problems will be discussed.

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Prefer Oral Session

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Prefer Poster Session

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